

NEWS from ARO-FE (Feb 23, 2001):

Optical fibers can be more transparent!!

ARO-FE has just awarded a “seed” project to Toyota Technological Institute (TTI) on the development of “more transparent” optical fibers. These fibers, made of silica glass, will enhance long-distance optical telecommunication networks worldwide.

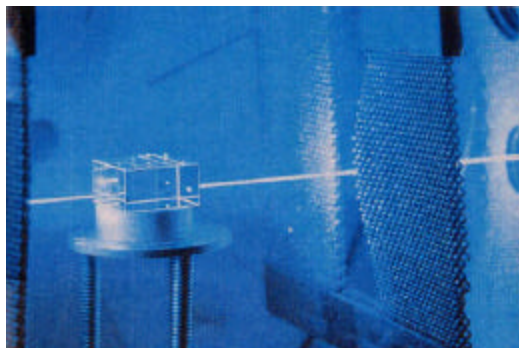
Silica glass is a superb material for photonics in its transparency, transparency wavelength range, mechanical strength, environmental durability, and more. Its transparency has been improved over years and reached to the best value of 0.15 dB/km at 1.55 μm wavelength. The value means that light intensity can be reduced after light travels over 20 km in silica glass. Still, many optical amplification facilities are needed, roughly every 100-200 km, to connect continents by the optical telecommunication. The demand for more transparent materials is a very big “must” in photonics.

The ARO-FE project with TTI could achieve a breakthrough in this product. The proposal is based on recent research results that, by encouraging structural relaxations in silica glass, its disordered structure related to the transparency or inversely the optical loss can be effectively reduced.

The proposal will exploit more possibilities to reduce the optical loss in silica glass, on the microscopic standpoint of view. Detailed study on the structural relaxation will yield not only the superb fiber material but also a new glass with better optical properties, e.g. ultraviolet transparency and ultraviolet durability.



‡ Optical Telecommunication Networks are spreading all over the world (Courtesy of KDD).



‡ Light scattering experiment with a silica sample (K. Saito et al., Toyota Technol. Inst.).